CORE-DRIVER DIODE ARRAYS

For Application With

- Magnetic Cores
- Plated-Wire Memories
- Thin-Film Memories
- Decoding or Encoding Applications

For Use In

- Airborne Computers
- Military Computers
- Industrial Computers
- Peripheral Equipment

description

These diode arrays are multiple diode junctions fabricated by a planar process and mounted in integrated circuit packages for use in high-current, fast-switching core-driver applications. These arrays offer many of the advantages of integrated circuits such as high-density packaging and improved reliability. These advantages result from such factors as fewer connections, more uniform device parameters, smaller size, less weight, fewer glass-to-metal seals, and the elimination of pressure contacts and whiskers.

The arrays are available in hermetically sealed, welded flat packages (F) or in dual-in-line plastic packages (N).

absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)

	FLAT PACKAGE			DUAL-IN-LINE PACKAGE			UNIT
	EACH DIODE		TOTAL DEVICE	EACH DIODE		TOTAL DEVICE	
8-DIODE ARRAYS (COMMON CATHODE) 8-DIODE ARRAYS (COMMON ANODE) 16-DIODE ARRAYS DUAL 10-DIODE ARRAYS DUAL 8-DIODE ARRAYS	TID21A TID23A TID25A TID29A TID131	TID22A TID24A TID26A TID30A TID132	ALL TYPES	TID121 TID123 TID125 TID129 TID133	TID122 TID124 TID126 TID130 TID134	ALL TYPES	
Peak Reverse Voltage (See Note 1)	60	40		60	40		V
Steady-State Reverse Voltage, V_R	40	25		40	25		V
Peak Forward Current at (or below) 25°C Free-Air Temperature (See Note 1)	500†			500‡			mA
Continuous Forward Current at (or below) 25°C Free-Air Temperature	300§			400¶			mA
Continuous Power Dissipation at (or below) 25°C Free-Air Temperature			500#			600Ø	mW
Operating Free-Air Temperature Range	−65 to 150			−65 to 125			°C
Storage Temperature Range	−65 to 200			−65 to 150			°C
Lead Temperature 1/16 Inch from Case for 10 Seconds	300			260			°C

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NOTE 1: These values apply for $t_w \leq 100$ µs, duty cycle ≤ 20%.

†Derate linearly to 150°C free-air temperature at the rate of 4 mA/°C.
‡Derate linearly to 125°C free-air temperature at the rate of 5 mA/°C.
§Derate linearly to 150°C free-air temperature at the rate of 2.4 mA/°C.
¶Derate linearly to 125°C free-air temperature at the rate of 4 mA/°C.
#Derate linearly to 150°C free-air temperature at the rate of 4 mW/°C.
ØDerate linearly to 125°C free-air temperature at the rate of 6 mW/°C.

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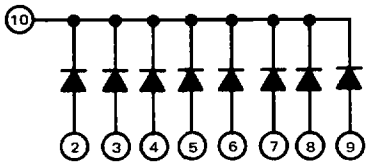
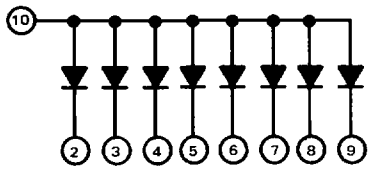
F FLAT PACKAGES

TID21A, TID22A
8-DIODE ARRAY (COMMON CATHODE)
10-PIN PACKAGE



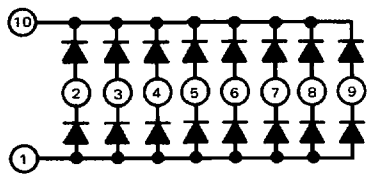
(1) No internal connection

TID23A, TID24A
8-DIODE ARRAY (COMMON ANODE)
10-PIN PACKAGE

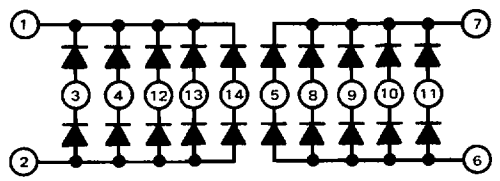


(1) No internal connection

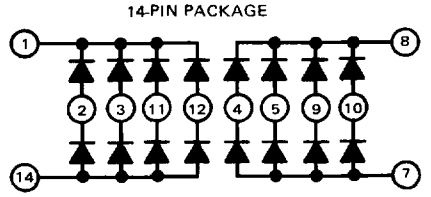
TID25A, TID26A
16-DIODE ARRAY
10-PIN PACKAGE



TID29A, TID30A
DUAL 10-DIODE ARRAY
14-PIN PACKAGE



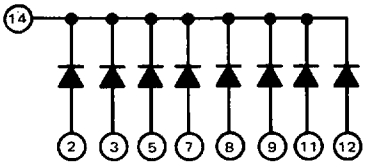
TID131, TID132
DUAL 8-DIODE ARRAY
14-PIN PACKAGE



(6) (13) No internal connection

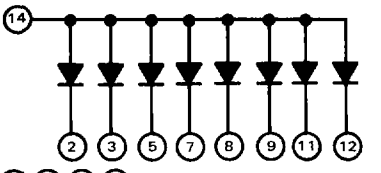
14-PIN N PLASTIC DUAL-IN-LINE PACKAGES

TID121, TID122
8-DIODE ARRAY (COMMON CATHODE)
14-PIN PACKAGE



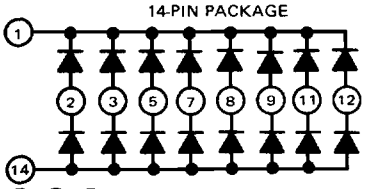
(1) (4) (6) (10) (13) No internal connection

TID123, TID124
8-DIODE ARRAY (COMMON ANODE)
14-PIN PACKAGE



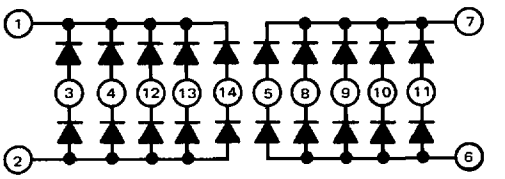
(1) (4) (6) (10) (13) No internal connection

TID125, TID126
16-DIODE ARRAY
14-PIN PACKAGE

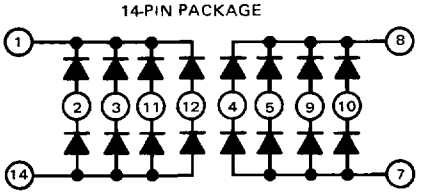


(4) (6) (10) (13) No internal connection

TID129, TID130
DUAL 10-DIODE ARRAY
14-PIN PACKAGE



TID133, TID134
DUAL 8-DIODE ARRAY
14-PIN PACKAGE



(6) (13) No internal connection

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electrical characteristics at 25°C free-air temperature

single-diode operation (see note 3)

PARAMETER		TEST CONDITIONS		TID21A TID121		TID22A TID122		TID23A TID25A TID29A TID123 TID125 TID129 TID131 TID133		TID24A TID26A TID30A TID124 TID126 TID130 TID132 TID134		UNIT
				MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$V_{(BR)}$	Reverse Breakdown Voltage	I_R = 10 μA,	See Note 2	60		40		60		40		V
I_R	Static Reverse Current	V_R = 40 V,	See Note 4		0.1				0.1			μA
		V_R = 25 V,	See Note 4				0.1				0.1	μA
V_F	Static Forward Voltage	I_F = 100 mA			1		1.1		1		1.1	V
v_F	Instantaneous Forward Voltage	I_F = 500 mA,	See Note 5		1.3		1.5		1.3		1.5	V
V_{FM}	Peak Forward Voltage	I_F = 500 mA,	See Note 6		5		5		5		5	V
C_T	Total Capacitance†	V_R = 0,	f = 1 MHz		4		4		8		8	pF

multiple-diode operation

PARAMETER		TEST CONDITIONS		ALL TYPES		UNIT
				MIN	MAX	
I_R	Static Reverse Current	V_R = rated V_R,	See Note 7		10	μA
V_F	Static Forward Voltage	I_F = 25 mA,	See Note 7		1	V

switching characteristics at 25°C free-air temperature

single-diode operation (see note 3)

PARAMETER		TEST CONDITIONS		ALL TYPES		UNIT
				MIN	MAX	
t_{fr}	Forward Recovery Time	I_F = 500 mA,	See Figure 3		40	ns
t_{rr}	Reverse Recovery Time	I_F = 200 mA, R_L = 100 Ω, See Figure 4	I_{RM} = 200 mA, i_{rr} = 20 mA,		20	ns

NOTES: 2. This parameter must be measured using pulse techniques. t_w = 100 μs, duty cycle ⩽ 20%.

3. Test conditions and limits apply separately to each of the diodes. The diodes not under test are open-circuited during the measurement of these characteristics except for the measurement of I_R on arrays having both common-cathode and common-anode diodes (see Figures 1 and 2).

4. For arrays having both common-anode and common-cathode diodes see Figures 1 and 2, Parameter Measurement Information section.

5. This parameter is measured using pulse techniques. t_w = 300 μs, duty cycle ⩽ 2%. Read time is 90 μs from the leading edge of the pulse.

6. The initial instantaneous value is measured using pulse techniques. t_w = 150 ns, duty cycle ⩽ 2%, pulse rise time ⩽ 10 ns. The total capacitance shunting the diode is 19 pF maximum and the equipment bandwidth is 80 MHz.

7. These parameters are measured with each of the other diodes in the section conducting 25 mA forward current. Each diode is individually tested after the device reaches operating thermal equilibrium. Test conditions apply separately to common-anode and common-cathode sections.

†C_T is the total pin-to-pin capacitance measured across any of the diodes. For arrays having both common-anode and common-cathode sections, the interaction of the other diodes cannot easily be separated out unless three-terminal guarded measurement techniques are used. The actual capacitance of a single isolated diode will typically be 30% of the measured pin-to-pin value for the common-cathode diodes, and 75% of the measured value for the common-anode diodes.

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PARAMETER MEASUREMENT INFORMATION

When measuring the reverse current of an individual diode of a device having both common-anode and common-cathode sections, the current meter must be placed so that the shunt current through the other diodes is bypassed around the meter. To obtain accurate readings, the voltage drop across the current meter must be less than 10 mV.

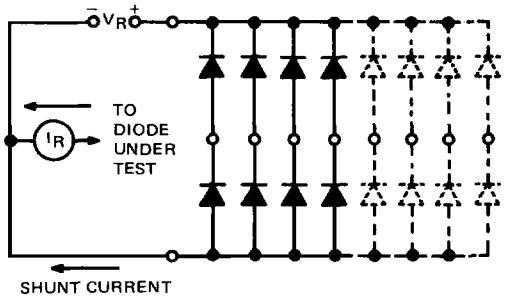


FIGURE 1–TEST CIRCUIT FOR COMMON-CATHODE DIODES

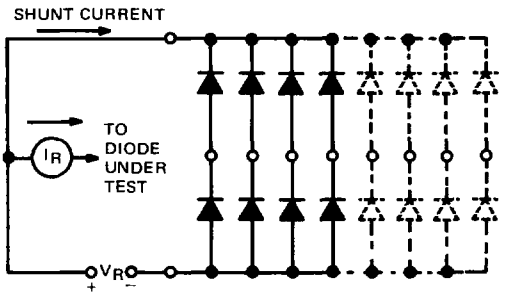
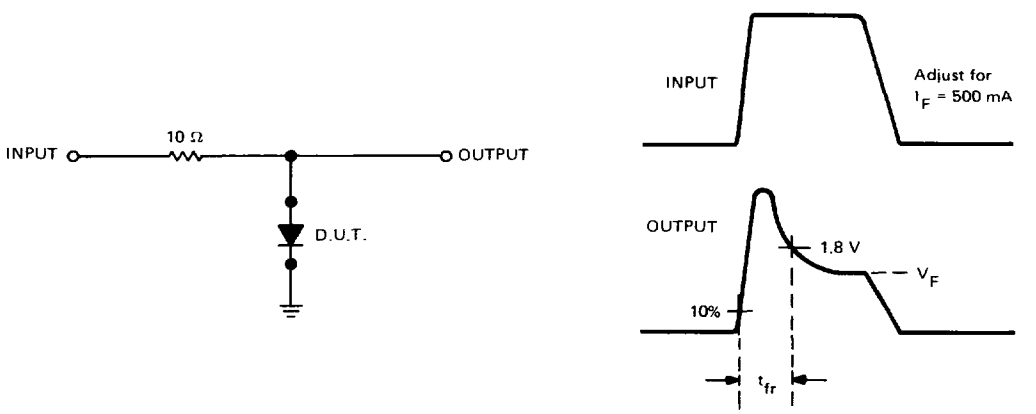


FIGURE 2–TEST CIRCUIT FOR COMMON-ANODE DIODES



TEST CIRCUIT **VOLTAGE WAVEFORMS**

FIGURE 3–FORWARD RECOVERY TIME

NOTES: a. The input pulse is supplied by a generator with the following characteristics: $t_r \leq 15$ ns, $Z_{out} = 50\ \Omega$, $t_w = 150$ ns, duty cycle $\leq 2\%$.

b. The output waveform is monitored on an oscilloscope with the following characteristics: $t_r \leq 4.5$ ns, $R_{in} \geq 1\ M\Omega$, $C_{in} \leq 5$ pF.

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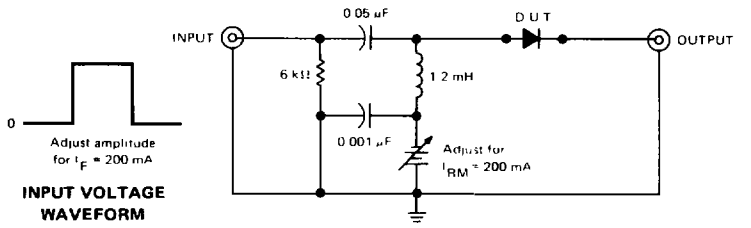
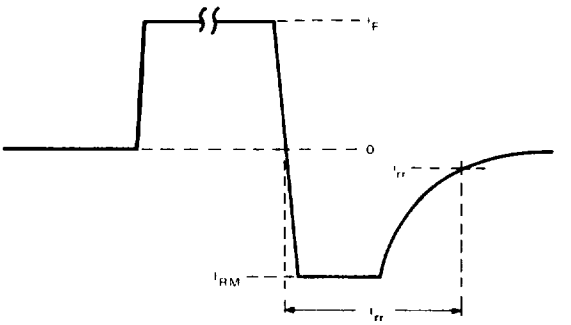
PARAMETER MEASUREMENT INFORMATION



INPUT VOLTAGE WAVEFORM

TEST CIRCUIT



OUTPUT CURRENT WAVEFORM

FIGURE 4—REVERSE RECOVERY TIME

NOTES: c. The input pulse is supplied by a generator with the following characteristics: $t_f \leq 1$ ns, $Z_{out} = 50\ \Omega$, $t_w = 200$ ns, duty cycle ≤ 1%.

d. The output waveform is monitored on an oscilloscope with the following characteristics: $t_r \leq 0.4$ ns, $R_{in} = 50\ \Omega$.

TYPICAL CHARACTERISTICS

FORWARD CONDUCTION CHARACTERISTICS

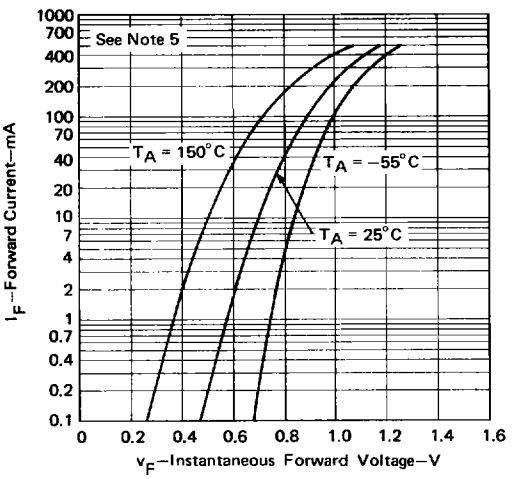


FIGURE 5

NOTE 5: This parameter is measured using pulse techniques. $t_w = 300\ \mu s$, duty cycle = 2%. Read time is 90 μs from the leading edge of the pulse.

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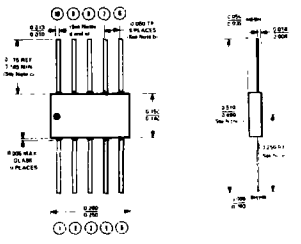
MECHANICAL DATA

F flat packages

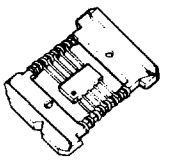
These hermetic packages feature glass-to-metal seals and welded construction in 10-pin and 14-pin configurations. Package body and leads are gold-plated F-15‡ glass-sealing alloy. Approximate weight is 0.1 gram. All external surfaces are metallic. Devices are shipped mounted in a Mech-Pak carrier.

TID21A, TID22A, TID23A, TID24A, TID25A, TID26A

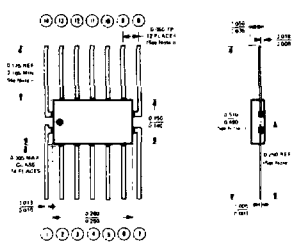


Falls within TO-89 dimensions

NOTES a. All dimensions are in inches.
b. Lead centerlines are located within ±0.005 of their true positions relative to body centerlines. This is measured along lines located within 0.030 from and parallel to the sides of the package.
c. Not applicable on Mech-Pak carrier.

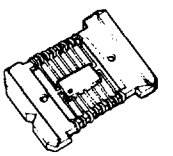


TID29A, TID30A, TID131, TID132



Falls within TO-84 dimensions

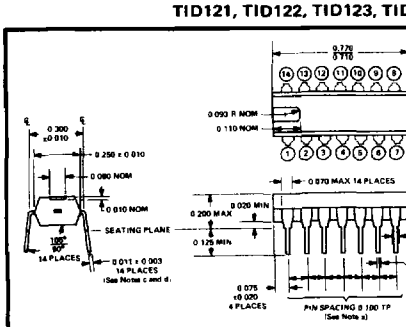
NOTES a. All dimensions are in inches.
b. Lead centerlines are located within ±0.005 of their true positions relative to body centerlines. This is measured along lines located within 0.030 from and parallel to the sides of the package.
c. Not applicable on Mech-Pak carrier.



N plastic dual-in-line package

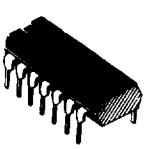
The compound used to mold the dual-in-line package will withstand soldering temperature with no deformation and circuit performance characteristics remain stable when operated in high-humidity conditions. These packages are intended for insertion in mounting-hole rows on 0.300-inch centers. Once the leads are compressed to 0.300-inch separation and inserted, sufficient tension is provided to secure the package in the board during soldering. The silver-plated leads require no additional cleaning or processing when used in soldered assembly.

TID121, TID122, TID123, TID124, TID125, TID126, TID129, TID130, TID133, TID134



NOTES a. The true position pin spacing is 0.100 between centerlines. Each pin centerline is located within ±0.010 of its true longitudinal position.
b. All dimensions are in inches unless otherwise noted.

Falls Within JEDEC TO-116 and MO-001AA Dimensions



‡F-15 is the ASTM designation for an iron-nickel-cobalt alloy containing nominally 53% iron, 29% nickel, and 17% cobalt.

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